

ENGINEERING

350-Ton Steel Tank For Nuclear Power Plant

► A 350-TON steel "tank," the largest ever assembled in a factory or shop, is now being readied for installation in the world's first floating nuclear reactor.

The watermelon-shaped container is 43 by 36 by 31 feet and will contain the heart of a 10 million-watt power plant to be housed in a converted Liberty Ship. The plant, which will be capable of powering a community of 20,000 people, will be "fueled" in July of 1965 and turned over to the Strategic Army Corps.

• Science News Letter, 86:40 July 18, 1964

EDUCATION

Math and Biology Gain Favor With Bright Youth

► INTEREST in mathematics and biology is on the upswing among America's most talented youngsters.

A recent survey of the top one percent of the nation's youth showed that these two fields of science have gained greatly in popularity in the past six years.

The National Merit Scholarship Corporation, Evanston, Ill., announced the huge increase in interest after studying the activities and interests of nearly 68,000 students who became semifinalists in the National Merit Scholarship competition in the years 1957-1963.

In 1958, only one percent of the male semifinalists and three percent of the females chose to major in biology. In 1963, the figures were three and seven percent.

Mathematics likewise has approximately doubled in interest. It attracted only 8% of the males and 11% of the females in 1958; last year it drew 16% and 18% respectively.

The same upward trend of math and biology has been evident in recent years among winners of the Science Talent Search for the Westinghouse Science Scholarships and Awards. The Search, conducted annually by SCIENCE SERVICE, is the oldest and largest science scholarship program in the United States.

Mathematics, which was in third place as recently as 1962, is now the number one choice among these talented youth. Biology and medicine are now almost as popular as the physical sciences.

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PHYSICS

New Device to Control H-Bomb Reactions

► A DEVICE aimed at controlling the fiery reactions of hydrogen bombs is being completed in Livermore, Calif.

Based upon the "Astron" concept, the new device at the University of California's Lawrence Radiation Laboratory, uses an electron accelerator that is the most powerful of its kind in the world. Fifty times a second, 200 trillion electrons are accelerated into a 90-foot tank where they form a

cylindrical layer that controls the reactions which take place inside.

The problems in controlling H-bomb reactions are to produce a hot plasma (a term used for matter in a gas-like state with broken-down molecules), then to confine it long enough for the necessary reactions to occur. The required reaction temperature is more than 100 million degrees.

The Astron device should both produce this plasma and trap it in a "magnetic bottle" formed by a magnetic field generated by the high-speed electrons in the tank. Scientists hope to confine the plasma long enough for the energy released by the H-bomb-like reactions to exceed the energy needed for the production and maintenance of the plasma itself.

The Astron concept is one of the four approaches attempting to control thermonuclear reactions, and the only one not discovered independently by foreign scientists.

Nicholas Christofilos, now director of the Astron experimental program at the Lawrence Radiation Laboratory, first formulated the Astron concept in 1952.

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PUBLIC HEALTH

Quarter Million Dollar Grant for Deafness

► YOUNG INVESTIGATORS will be encouraged to enter a neglected field—deafness research—through a grant of more than a quarter of a million dollars made by the Alfred P. Sloan Foundation to the Deafness Research Foundation, New York.

"Otologic investigation has lagged far behind research into other health problems, many of which have considerably less bearing on the physical, psychological and economic well-being of society," Mrs. Hobart C. Ramsey, president of the Deafness Research Foundation declared.

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MEDICINE

Heart Disease Linked To Smoking in Studies

► EVIDENCE from two studies indicates heart disease cases are twice as frequent among cigarette smokers as among non-smokers.

Dr. W. B. Kannel, director of the Heart Disease Epidemiology Study in Framingham, Mass., said the danger from smoking seems to be that the nicotine increases the production of adrenalin in the body.

The results of this increased production of the hormone greatly strain the heart and circulatory system, markedly increasing the chances for a coronary disaster, he said.

Dr. Kannel pointed out that his study, and another study made in Albany, N. Y., have indicated no cumulative effects of smoking on heart diseases. If a person stops smoking, the trouble also stops, he reports in the *Annals of Internal Medicine*, journal of the American College of Physicians.

This contradicts findings on smoking and lung cancer, as noted in the Surgeon General's report on Smoking and Health.

• Science News Letter, 86:40 July 18, 1964

IN SCIEN

PUBLIC HEALTH

Exhaust Fumes Can Make Drivers Appear Drunk

► SOME DRIVERS thought by police to be drunk may be suffering mainly from carbon monoxide poisoning, which causes similar symptoms. The risk of this happening is greater than supposed, research by the forensic medicine department of the London Hospital showed.

The researchers, Prof. Francis Camps, pathologist, Dr. Joan Horder and L. M. Barnes, engineer, said carbon monoxide traces could disappear before a driver's blood is tested.

Their report indicates that in modern autos air intake for heaters can be so located that air is drawn in from another vehicle's exhaust line. Also, leaving a window slightly open on long drives can cause exhaust-fouled air to be drawn in through small apertures.

The rear end of many autos acts as a scoop which throws the car's own exhaust gases forward and causes heavy contamination in the trunk. Since in most cases the rear seat is not sealed, these gases penetrate into the car's interior.

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ENGINEERING

Water Believed Cause Of Concrete Creeping

► THE PRESENCE of water in concrete has been found to be a contributing cause of "creep," the slow deforming of concrete under pressure.

Concrete, which is made of aggregate, that is, rock fragments held together by hardened cement paste, tends to deform slowly under its own weight or the load it carries. Thus, creep has become a costly problem in building highways, bridges or other concrete structures.

Two Purdue University engineers, studying the cement paste component of concrete, made two sets of sample cylinders of paste. One set was kept completely dry, while the other was kept saturated with water. Both were put under pressure and studied at controlled temperatures.

When measured with an optical strain gauge for nearly 1,000 hours, the cylinders saturated with water exhibited creep, while the oven-dried specimens showed no evidence of creep.

Dr. Wesley G. Mullen and Prof. W. L. Dolch, told the meeting of the American Society for Testing and Materials in Chicago that even apparently dry concrete may contain enough water to show this effect.

In addition to the water factor, the investigators observed a positive relationship between concrete shrinkage when drying out, and the creep behavior.

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CE FIELDS

TECHNOLOGY

Electronic Clerk Reads Typewritten Pages

➤ A MACHINE that can actually read typewritten pages at 2,000 letters per second is employed as a file clerk.

The device is transferring typewritten records to magnetic tape for the Fireman's Fund Insurance Company in San Francisco. The first such device in regular commercial use, it can be used with standard typewriters and does not require special type faces.

Called the Electronic Retina Character Reader, the machine was developed by Recognition Equipment Incorporated of Dallas, Texas.

• Science News Letter, 86:41 July 18, 1964

ENGINEERING

New Engineers Get Jobs; Older Men Less Sought

➤ ENGINEERING graduates of the next few years will find jobs easily. But older and more experienced engineers may have difficulty.

Hiring of engineers is down and it is the older men who are being cut. Eleven percent fewer will be hired this year than last, the Engineering Manpower Commission of Engineers Joint Council predicts on the basis of a survey of 543 companies employing 250,000 engineers. Last year fewer were hired than the year before.

By 1973, the total number of engineers employed in the United States will be 26% greater than it is today, it is now estimated. Earlier estimates, based on the high hiring rate of the 1950's, predicted an increase of 67% for the coming decade.

Hiring of scientists, mathematicians and technicians is also expected to be less than in the past. As with the engineers, new graduates are still in demand, however.

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MEDICINE

Smoke Substance May Produce Mice Cancers

➤ A SUBSTANCE suspected as being present in tobacco smoke has caused lung cancer in mice and is under study for a possible human cancer link.

A team of researchers at the Chester Beatty Research Institute, London, reported that nitrosornicotine is a powerful cause of pulmonary cancer in mice, although its relation to the human smoking habit remains to be clarified.

Nitrosornicotine was prepared by treating nicotinic acid with sodium nitrate in dilute hydrochloric acid solution and by later distillation, using ether in the process.

After injection once a week for 41 weeks with 0.1 milliliters of two percent nitrosornicotine dissolved in arachis oil, numerous tumors were found in mouse lungs at autopsy.

The research was reported in *Nature*, 202:1126, 1964, by Drs. E. Boyland, F. J. C. Roe and J. W. Gorrod. Joint support to the research was granted by the Medical Research Council, the British Empire Cancer Campaign, the U.S. Public Health Service's National Cancer Institute and the Tobacco Research Council.

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TECHNOLOGY

Sounds Detect Loose Parts in Transistors

➤ SOUNDS too high for man to hear are finding loose parts and other defects in transistors, micro-circuits and other solid state components.

A new device, developed by the Delcon Corporation, Palo Alto, Calif., vibrates components at up to 200 times the force of gravity, producing ultrasonic sound waves. Special microphones inside the machine detect the rattling of loose parts as light as 50 micrograms.

The new device enables much faster and cheaper testing of components as well as detection of non-metallic objects that would not be revealed by conventional X-ray techniques.

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TECHNOLOGY

Losing Beats Winning When Computers Play

➤ LOSING is definitely better than winning, if a computer is playing the game.

The study of how and why a computer loses a game provides much more information than simply perfecting the computer program so it will always win, contends Dr. Oliver Selfridge of the Massachusetts Institute of Technology, Cambridge.

There is a broad range of games that have been taught to computers. In some, like tic-tac-toe, perfect teaching of the computer assures perfect games, Dr. Selfridge said. But in most cases the machine can lose, and often does.

In strategy planning for war games, for example, instead of trying one approach after another, the computer should analyze its loss and compare it with all its past attempts, thereby building up "experience."

Much more information is gained from teaching a computer to play games such as chess, which it cannot always win, than from simply exploring different winning strategies for games that have been mastered by the machine, like ordinary tic-tac-toe, or even three-dimensional tic-tac-toe.

It is the unsolved problems created when a computer loses a game that open up new avenues of research, Dr. Selfridge told SCIENCE SERVICE.

Dr. Selfridge spoke at the first Symposium of Computer Augmentation of Human Reasoning in Washington.

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TECHNOLOGY

Eye Camera May Help Post Office Training

➤ A CAMERA that records the movements of the eye may aid in training postal clerks of the future.

In the new device, a spot of light is reflected from the cornea of the eye, while a camera photographs both the spot and the person's field of view. The light spot moves with the eye and indicates the exact spot at which the person is looking.

Dunlap and Associates, Darien, Conn., working for the Post Office Department, have correlated eye movements in reading addresses with hand movements in sorting letters into the appropriate "pigeon holes." Analysis of these data will be used to improve both personnel training and manual sorting equipment.

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ENTOMOLOGY

Killer Snails Pitted Against Crop Pests

➤ AUSTRALIAN OFFICIALS plan to import cannibal snails to wipe out the ordinary snails which yearly cause thousands of dollars in damage to grapefruit and vegetable crops.

The Victorian Department of Agriculture and the Federal Government's Council for Scientific and Industrial Research Organization are considering a plan to import the snails to the rich Mildura fruit and wine growing district in northwestern Victoria.

The use of cannibal snails, known scientifically as *euglandinas*, was suggested by the director of the British Commonwealth Biological Control at Trinidad, Dr. F. J. Simmonds.

Dr. Simmonds had discovered that Mildura's climate would be suitable for survival of cannibal snails. These snails do not eat foliage but only ordinary snails and have been used with great success in warm countries. They die out when they have annihilated the ordinary snail population. They have completely eaten out ordinary snails in Bermuda, Mauritius, North Borneo, Hong Kong and India.

Such introductions are part of a world-wide effort to find animals which, when introduced into a new area, will control a pest in that area.

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TECHNOLOGY

China Uses Glass Fiber In Industrial Processes

➤ FIBER GLASS is being used to replace cotton, silk and other materials made from natural fibers in many industrial enterprises in Communist China.

More than 60 varieties are now being produced.

Electrical engineering, metallurgical, coal, oil, chemical and light industrial plants have adopted this new material because of its high tensile strength and resistance to high temperature and corrosion. It is being used for thermal and electrical insulation.

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